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10/519,779	12/29/2004	Yuji Sakamoto	10921.266USWO	7310
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HAMRE, SCHUMANN, MUELLER & LARSON, P.C.			HSU, AMY R	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/519,779

Applicant(s)

SAKAMOTO, YUJI

Examiner

Amy Hsu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/11/2005, 12/29/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6,9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akimoto et al. (US 7161630) in view of Hong et al. (US 6801483).

Regarding Claim 1, Akimoto teaches an image sensor module comprising: an image sensor chip (*Fig. 2 reference number 2*) mounted on a substrate (*Fig. 2 reference number 1*); a housing installed on the substrate (*Fig. 2 reference number 42 and 31 are holders that comprise the housing installed on reference number 1, the substrate, See also Col 3 Lines 5-9*) and having a step portion for retaining a lens above the image sensor chip (*Fig. 2 reference number 31, the right side shape has a step portion that retains a lens, reference number 32 above the sensor chip, reference number 2*); a lens unit placed on the step portion for forming an image of an object on the image sensor chip (*reference number 32*); and a lens retainer installed on the housing (*reference number 33*); Akimoto fails to teach the lens retainer comprises an elastically deformable portion, and the lens unit is pressed against the step portion of the housing by a biasing force caused by the elastically deformable portion.

Hong teaches an apparatus with a lens and lens holder (*Col 1 Lines 46-48*) where the lens holder, or the portion that holds the lens including the lens retainer, has an elasticity in order to minimize a constraining force about the lens holder (*See Col 4 Lines 32-35*).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Akimoto with that of Hong because using a material with elasticity on the portion of the lens holder contacting the lens will allow the lens to be held in place while preventing too much force which would cause damage.

Regarding Claim 2, Akimoto teaches the image sensor module according to claim 1, wherein the lens retainer further comprises a first portion fixed to an upper face of the housing (*Fig. 2, the portion of 33 to the left of the labeled 33a is a portion of the lens retainer that is fixed to the upper face of the housing, reference number 31*), and a second portion held in contact with an upper face of the lens unit (*Fig. 2 reference number 33, the bottom face towards the middle is held in contact with the upper face of the lens, reference number 32*). Akimoto fails to teach the elastically deformable portion being disposed between the first portion and the second portion.

Hong teaches that which holds the lens is elastic to hold the lens in place while minimizing any constraining force (*Col 4 Lines 32-35*). This elastic portion would apply to the area of the support, or lens retainer, that contacts the lens in order to accomplish the stated purpose.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Akimoto with that of Hong in order to dispose between the first and second portion in Akimoto, an elastically deformable portion to hold the lens in place with enough force to hold it securely but not cause damage.

Regarding Claim 3, Akimoto teaches the image sensor module according to claim 2, wherein the first portion of the lens retainer is formed with a projection, the upper face of the housing being formed with a recess for engagement with the projection. Fig. 2 shows the first portion of the lens retainer having a projection, the left most part of reference number 33, to the left of the labeled 33a, and the housing, reference number 31 receiving the projection at the left most and right most portions of 31.

Regarding Claim 4, Akimoto teaches the image sensor according to claim 2, wherein the lens retainer covers a portion of the upper face of the lens unit except for a predetermined central area of the lens unit. See Fig. 2. The lens clamp, 33, does not cover the predetermined central area of the lens unit.

Regarding Claim 5, Akimoto teaches the image sensor module according to claim 2, wherein the lens unit includes an upper portion protruding above the upper

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face of the housing. Fig. 2 shows the lens unit at the left and right most upper areas protrudes above the upper face of the housing, 31, in order to be held up by 31.

Regarding Claim 6, Akimoto teaches the image sensor module according to Claim 2, wherein the lens retainer includes an intermediate portion between the first portion and the second portion, the intermediate portion being formed with a recess for thickness reduction. In Fig. 2, the intermediate portion of the lens retainer is the piece above the area labeled 31a, being between the first portion, to the left of 33a, and the second portion, above the lens. This intermediate portion is recessed and has less thickness than the first and second portions.

Regarding Claim 9, Akimoto teaches the image sensor module according to claim 1, further comprising an additional step portion located below the first-mentioned step portion, and an optical filter installed on the additional step portion. Fig. 2 shows the optical filter, reference number 35, on a step portion below the first step portion.

3. Claims 7-8, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akimoto et al. (US 7161630) in view of Hong et al. (US 6801483), further in view of Tochigi et al. (US 5963378).

Regarding Claim 7, Akimoto in view of Hong teach the image sensor module according to claim 1, but fail to teach the limitations of Claim 7.

Tochigi teaches a lens unit comprising a combination of a first lens and a second lens, the first lens having a concave lens face, the second lens member having a convex lens face that is spaced from the concave lens face (*Col 17 Lines 11-16*).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Akimoto with that of Tochigi to add a zoom lens with two lenses, concave and convex, to the apparatus taught by Akimoto in order to allow the user to have the zoom capability.

Regarding Claim 8, Akimoto in view of Hong further in view of Tochigi teach the image sensor module according to claim 7. Although Tochigi does not further teach the first lens having a positioning projection, the second lens having a recess for engagement with the positioning projection, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching to include this limitation because connecting two elements such as lenses by using a projection and a recess would yield predictable results in this context.

Regarding Claim 12, Akimoto teaches the image sensor module according to claim 10, and teaches the lens unit integrated with the spacer (*Fig. 2, reference number 32 is integrated with reference number 34, or brought together to make the*

apparatus taught by Akimoto) but fails to teach a first lens integrated with the spacer and a second lens combined with the first lens.

Tochigi teaches two lenses making up a lens unit, where the second lens is combined with the first lens (*See Fig. 1 and Col 17 Lines 11-16*).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Akimoto with that of Tochigi to comprise the lens unit of two lenses in order to achieve zoom functions.

4. Claims 10-11,13,15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akimoto et al. (US 7161630).

Regarding Claim 10, Akimoto teaches an image sensor module comprising: an image sensor chip mounted on a substrate; and a lens unit including a lens portion that faces the image sensor chip (*Fig. 2*), and a spacer extending downward from the lens portion; wherein the spacer directly contacts the image sensor chip (*Fig. 2 reference number 34 acts as a spacer extending downwards from the lens level*). Although the spacer contacts the image sensor chip via a wire connecting to the adhesive that holds the spacer to the substrate, it would have been obvious to one of ordinary skill in the art at the time of the invention to connect the spacer directly to the image sensor chip because the electrical connection would be the same, therefore yielding predictable results.

Regarding Claim 11, Akimoto teaches the image sensor module according to claim 10, wherein the spacer is fixed to the image sensor chip via an adhesive. Fig. 2 shows the spacer fixed to the substrate via an adhesive, reference number 36, however it would have been obvious to one of ordinary skill in the art at the time of the invention to connect the spacer to the chip, rather than the substrate because Fig. 2 shows the spacer is connected to the image sensor chip, via 2b, therefore the electrical connection would be the same and would produce predictable results.

Regarding Claim 13, Akimoto teaches the image sensor module according to claim 10, further comprising an optical filter that covers the lens portion of the lens unit. Fig. 2 reference number 35 is an optical filter that covers, or is as wide as, the lens portion, reference number 32.

Claim 15 is a method claim corresponding to Claim 10 and is therefore rejected similarly.

Regarding Claims 16 and 17, Akimoto teaches an image sensor module, which comprises an image sensor chip, mounted on a substrate and a lens unit having a lens face that faces the image sensor chip. The method of manufacturing the apparatus taught by Akimoto is rejected because the apparatus taught by Akimoto is rejected (*see the paragraph regarding Claim 1*). Although Akimoto does not discuss the method of manufacturing the apparatus taught, and does not further disclose the specific

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manufacturing details such as adjusting and fixing a distance between the image sensor chip and the lens face, it would have been obvious to one of ordinary skill in the art at the time of the invention to conclude that in order to realize the apparatus taught by Akimoto, one would deduce that certain manufacturing steps such as adjusting the correct distance between the image sensor chip and the lens face before fixing the lens would need to be performed in order to achieve the apparatus taught by Akimoto. The distance between the lens and the image sensor affects the quality and amount of light hitting the image sensor array, and thus the distance is a key factor in the quality of the images produced by the apparatus, therefore this distance must be adjusted to the most optimal distance before fixing it in place. Thus, regarding Claim 17, it would have been obvious to one of ordinary skill in the art at the time of the invention to realize that the optimal distance to place the lens with respect to the image sensor chip would be achieved by adjusting the distance and capturing an image at different distances to determine which is most optimal. This method of testing all possibilities of distances to find the distance which produces the best quality images would yield the predictable result that the image with the best quality would determine which distance is most optimal.

Regarding Claim 18, Akimoto teaches the manufacturing method according to claim 16, but fails to teach the lens unit is fixed by using ultraviolet curing resin. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of using ultraviolet curing resin to fix the lens unit because since this

method is well known in the art of semiconductor manufacturing, using this method would yield highly predictable results.

Regarding Claim 19, Akimoto teaches the manufacturing method according to claim 16. The distance between the image sensor chip, reference number 2, and the lens face, reference number 32, according to the configuration shown in Fig. 2 can only be adjusted by adjusting the housing since it is the only thing between the lens and the image sensor chip that can adjust the height or distance. Adjusting the housing that holds the lens will adjust the distance between the lens and the sensor chip as seen by the configuration in Fig. 2.

Regarding Claim 20, Akimoto teaches the manufacturing method according to claim 16, wherein the distance is adjusted by moving the lens unit relative to a housing fixed to the substrate. In Fig. 2, the distance between the lens and the image sensor is in the vertical direction between 32 and 2. Therefore to adjust this distance, the lens unit must move in the vertical direction relative to 34, which is the housing fixed to the substrate.

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akimoto et al. (US 7161630) in view of Sugiura et al. (US 5225936).

Regarding Claim 14, Akimoto teaches the image sensor module according to claim 13, but fails to teach the limitation of Claim 14. Sugiura teaches a lens configuration comprising a diaphragm disposed between the lens unit and the optical filter (see *abstract*). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Akimoto with that of Sugiura to place the diaphragm in a position to focus the light coming from the lens to the image sensor in order to equally diverge the light onto the image sensor.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure including Bean (US 6608648), Toyoda (US 2001/0012073).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy Hsu whose telephone number is 571-270-3012.

The examiner can normally be reached on M-F 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on 571-272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amy Hsu
Examiner
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ARH 8/18/2007

A handwritten signature in black ink, appearing to read 'Lin Ye', with a long horizontal flourish extending to the right.

LIN YE
SUPERVISORY PATENT EXAMINER